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## МАТЕРИАЛЫ КОНФЕРЕНЦИИ И ШКОЛЫ

# MECHANISMS OF VISION ADAPTATION TO THE LIGHT ENVIRONMENT IN THE SHRIMPS OF THE GENUS MYSIS (CRUSTACEA)

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The genus of crustaceans Mysis can be considered as an exceptionally convenient model for studying their epigenetic and "fast," physiological adaptive response to changes in the conditions of the light environment and other environmental factors (salinity, etc.).

The report presents the results of a long-term comparative physiological study of the mechanisms of adaptive changes in the spectral sensitivity of the eye and the spectral tuning of rhodopsin in crustaceans, including shrimp of the genus Mysis (genus Mysis; Mysida, Crustacea), depending on the habitat (Jokela-Määttä et al., 2005, Donner et al., 2016, Feldman et al, in press).

The sea and lake populations of the Mysis relicta species separated relatively recently – at the end of the glacial period, about 10,000 years ago. In accordance with the light habitat, they contain two spectrally different visual pigments ($\lambda$max 530 and 560 nm), located in different rhabdoms (Jokela-Määttä et al., 2005, Zak et al., 2013). Both pigments contain retinal 1 (A1) as a chromophore (Belikov et al., 2014). No difference was found in the opsin gene encoding their amino acid sequence (Audzijonyte et al., 2012). Probably, some epigenetic factors determine their different spectral characteristics.

Dark adaptation in shrimp of the sea population after exposure to strong light is provided by the process of rhodopsin regeneration, while in the lake population by renewal of photoreceptor membranes (Feldman et al., in press).

In the formation of spectral sensitivity of the eye M. relicta an important contribution is made by screening pigments, in particular xanthomatins (Abu Hamidah et al., 2010).

The eyes of the lake population are much more sensitive to photodamage than the eyes of the sea one. Ommochrome granules and the carotenoid astaxanthin, as screening and antioxidant pigments, make an important contribution to protecting the eye structures from the hazard of light damage (Dontsov et al., 1999, Feldman et al., 2010).